

Point. Click. Detect.

Find fiber faults in seconds with the F3X. See pages 18–21.

>> Get the right network testing technologies, at the right prices, right here, right now.



Gigabit Testing

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Fiber Loss Measurement

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Light Sources

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The best professional testing solutions—from

With the latest products, our great selection, the best prices, and our awesome FREE, 24/7 Tech Support, Black Box is your go-to source for testers. Whether you need to maintain a small office or a large enterprise, you'll find the best professional testing solutions right here. You'll even find new testers you won't find anywhere else, like the unique, point-and-shoot F3X Fiber Fault Finder Gun on pages 18–21.

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What's inside:

LanScope

Advanced network testing at an affordable price.

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Validator

Certify, identify, configure, and document a network with one tool!

Pages 6–7



LAN Solution GB Network Tester Kit

Get a high-end tester plus an easy-to-use Gigabit and PoE tester in one.

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LanTest Pro Cable Tester Kit

Test CAT6 Gigabit cable runs with this advanced but easy-to-use tool.

Pages 10–11



CAT6 LAN Performance Verifier

Digitally—and economically—certify UTP cables and devices.

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TVR, SOHO, and Wi-Net Testers

Inexpensive staples for every toolbox.

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Tones, Probes, and Taps

Diagnose your network to keep it healthy.

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Fluke Copper Testers

Popular Fluke Networks® testers for maintaining your copper network.

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“Your Tech Support person was not only courteous, but he led us ‘by able to pinpoint... our connectivity problems.’”

the pros at Black Box.



TURN PAGE

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F3X Fiber Fault Finder Gun

Be a fiber spy with this super-cool new product.
Pages 18–21

Get it here first!



Light Sources and Power Meters

The dynamic duo of fiber testing.
Pages 22–25



Visual Fault Locators

Only your mother-in-law could find more faults.
Page 26



Live Traffic Identifier

Safely repair a problem fiber without disrupting live fibers.
Page 26



Fusion Splicer

Get FREE calibration for three years.
Page 27



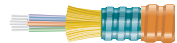
Fluke Fiber Testers

Get the best of both: Fluke Networks® testers and FREE Black Box Tech Support.
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Cable

Our most popular fiber and copper cable.
Pages 30–31.



Tool Kits

The tools you need to install and maintain networks.
Page 32



the hand' through testing and verification procedures until we were



Robert J. Dour, Manager Data Processing

Gain more business with the Black Box Integrator Program.

When you team with Black Box Network Services, you put a mature, worldwide organization with more than 30 years of experience to work for you. Black Box is the largest independent provider of voice and data network services with deep roots in networking products. Clients in 141 countries depend on Black Box for complete business communications networks from design and products through installation and support.

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Tone Plus.**

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Erik McEwen, Clinical Engineer, Jordan Valley Hospital, UT

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LanScope Network Analyzer

Advanced Gigabit network and cable tester provides expert help at

- Quickly maintain and optimize 10/100/1000BASE-T networks with a single tester.
- Analyze and troubleshoot networks from the cabling to the packet.
- Ideal for LAN installers, technicians, managers, and service providers.
- Features include cable testing, link detection, ping and trace, packet monitoring, traffic generation, VoIP, e-mail, inline PoE tests, device discovery, and more.
- Provides complete inline packet inspection, monitoring, filtering, and capture.
- Flexible traffic generation and structured stress tests your network under varying loads.
- VoIP, e-mail, and inline PoE tests ensure proper network performance.
- Measures PoE voltage and power.
- Processes VoIP traffic to determine call statistics and quality.
- Qualifies network segments with stress test prior to activating.
- Automatically identifies standard link, frame, and traffic problems.
- Identifies connected network devices by type, IP address, or MAC address.
- Tests cables for opens, shorts, reversed pairs, split pairs, and length.
- ♦♦ **WARRANTY** —1 Year

Make the LanScope Network Analyzer an essential part of your tool kit. Use it for installing, monitoring, maintaining, upgrading, and troubleshooting any network. With this one tool, you have one of the most complete suites of testing and analysis functions available at a very affordable price.

Use the Inline mode to non-intrusively monitor network traffic (10/100/1000BASE-T) to identify protocols, port usage, VoIP statistics, and network utilization. The LanScope can capture and store up to 10,000 packets with user-defined filters for detailed analysis in the field. Or download test results over the network or to a flash drive.

The analyzer features two RJ-45 ports, which you can use for tests such as PING, Link, Trace, and Discovery to quickly identify network prob-

lems. The LanScope can also generate up to 100% traffic loading with control of packet rate and size to demonstrate network performance at various traffic levels.

You can perform a stress test that generates traffic and measures performance in accordance with RFC 2544. Run the test using the two independent ports on a single unit or run it with a second unit located remotely on the network.

PoE tests include voltage and inline current measurement to determine the actual power used by a device.

Lastly, use the LanScope to test cables for shorts, opens, split pairs, and reversed pairs; measure cable length; and to generate tones for cable tracing.

Pro-Tips

#1. Identify bandwidth bandits.

If your network suddenly slows down, you may have a bandwidth bandit on your hands. If you suspect someone is streaming video or downloading movies, be a sleuth and find the bandit's address with LanScope. Use it to identify all the top talkers on your network. You may even discover that only a few addresses are using 50% or more of your total bandwidth.

Won't they be surprised when you show up at their door?

#2. Discover unwanted guests.

An important part of your job is protecting your network. LanScope can help. Use it to identify illegal devices on your network. If a guest or coworker connects an unauthorized laptop to your network, you need to know about it.

an affordable price.



Identify the top talkers on your network.



Identify network protocols being used.



The Expert feature provides solutions to common network problems.

TECH SPECS

Display — Color LCD touch screen, 320 x 240 RGB
Temperature — Operating: +32 to +122° F (0 to +50° C);
Storage: +14 to +131° F (-10 to +55° C)
Test Modes — Inline; single-ended; dual independent
CE Approval — Yes
Connectors — (2) RJ-45; (1) USB Type A; (1) USB Type B
Power — Lithium ion battery pack, AC adapter
Size — 2.8" H x 4" W x 6.5" L (7.1 x 10.0 x 16.5 cm)
Weight — 1.4 lb. (0.6 kg)

Item	Code	List Price
LanScope Network Analyzer	LANSCOPE	\$1895.00
You may also need...		
10/100 Copper Tap	TS230A-R2	\$349.95
10/100/1000 Copper Tap	TS250A	\$849.95
(For more taps, see p. 15.)		

Validator NT

The all-in-one tester for certifying, identifying, configuring, and

- A great value for technicians charged with troubleshooting interconnections. This kit includes everything you need to test, trace, and tune your network.
- Certifies individual Ethernet cable runs at up to Gigabit speeds per IEEE 802.3 specifications.
- Identifies active components of your network at the remote cable end.
- Configures links between nodes at Gigabit speed.
- Use the included software to document your network and print job reports.
- Port discovery and ping features.
- ♦♦ **WARRANTY** — 1 Year

Lugging about multiple testers to perform a number of network tests? Lighten your load with the Validator NT. This kit has all that you need to certify, identify, configure, and document your network, as well as test coax, phone, audio, and security wiring.

With its certification capabilities, you can test for TIA 568 interconnect problems, pinpointing fault locations, and determining cable length and delay as well as noise conditions. At Gigabit speed, you can configure links between nodes on your network, checking IP addresses and more.

You can also use the Validator NT to validate whether a network performs at advertised speeds, making it ideal for billing a cable installation job.

Test and certify each cable run, print the results, and attach them to your invoice. It's that easy!

The tester also has port service discovery features and enables you to access IP addresses and ping equipment and flash hubs and switches for positive port location. No other tester/certifier does so much!

Produce elaborate test schedules and document test results, then print them with Plan-Um™ software (included). It ties together all the different cable criteria in complex installations and displays cable and equipment connections graphically. You can also use Plan-Um to create office layouts or import CAD drawings.

Functions included

Signal tests on network cable:

- Wire map up to eight locations at a time
- TDR distance to opens and shorts
- Skew
- NEXT (all combinations on all 12 pairs)
- Channel response
- Echo testing (return loss) for impedance mismatches
- Signal-to-noise ratio (attenuation, amplitude, return loss)

Performance and speed certification:

- Supports IEEE 802.3 speed criteria with full BERT
- Tests interconnect specifications per TIA 568/570
- Measures signal quality through the cable against set criteria on cable data-carrying capability in real time
- Measures signal quality in actual link environments to help determine cause of any cable inadequacies

What's included

- Validator NT main testing unit
- Validator NT Smart Remote unit
- (8) wire map remotes, RJ-45
- (2) lithium ion rechargeable batteries
- (2) AC adapter charger units
- (4) adapter cables:
 - (2) 8-position shielded RJ-45 modular jack cables with (8) alligator clips each
 - (2) 6-position RJ-12 modular jack cables
- (2) shielded RJ-45 patch cables
- (2) "F" coax to BNC (video) adapters
- USB cable
- 64 MB compact flash card
- Plan-Um design layout software

➡ **Click and find at blackbox.com.**
For additional wire mapping capabilities, see the Wire Mapping Kit (FT970A)

documenting a network!

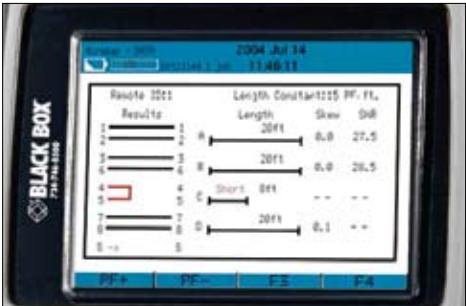


Main Testing Unit

Remote Unit

TECH SPECS

- Cable Length for Split Pairs Testing (Maximum)** — 1500 ft. (457.2 m), depending on cable type
- Cable Types** — Shielded or unshielded CAT3, CAT5, CAT5e, CAT6; telephone; coax; speaker; and security and alarm wiring
- Display** — 256-color active backlit LCD
- Keypad** — Full navigation set; alphanumeric data entry; soft key functions
- Operating System** — Linux®
- Interface** — (1) serial port for direct printing; (1) USB for uploading files from/to a laptop or PC
- Power** — AC adapter and (2) lithium ion rechargeable batteries (included)
- Size** — Main unit: 9"H x 4.5"W x 2.1"D (22.9 x 11.4 x 5.3 cm); Smart Remote unit: 5.6"H x 4.4"W x 1.8"D (14.2 x 11.2 x 4.6 cm)
- Weight** — Main unit: 1.6 lb. (0.7 kg); Smart Remote unit: 0.75 lb. (0.3 kg)

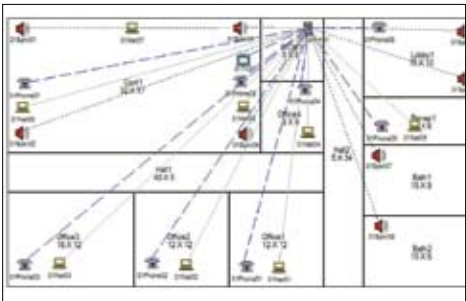


The Validator NT shows cable lengths as well as distances to shorts and faults.

Pro-Tips

Hate paperwork? Plan-Um.

Network cabling documentation is critical, but it can be a hassle and very time consuming. Save yourself a lot of time—and money—by using Plan-Um™ software. It comes with the Validator NT and is an invaluable documentation tool. Use it to draw floor plans, drop in specific ports, document cable runs, generate test reports, print custom cable labels, and more. If you'd rather spend your time doing more productive things than pushing paper, Plan-Um is for you.



Create a complete layout of a network and cable pathways with the included Plan-Um software.

Item	Code	List Price
Validator NT	NT955	\$1495.95

LAN Solution GB Network Tester Kit

Test CAT6 Gigabit Ethernet cable runs quickly and easily.

- Test PoE to ensure adequate power for powered devices such as VoIP phones.
- Detects and reports speed, duplex mode, wiring mode, and polarity of transmit pair for active Ethernet and other devices up to 1 GB.
- Network testing for port discovery, ping test, and hub flash.
- Simultaneously pings three addresses to verify connectivity to network devices.
- Blinks a link indicator to identify hub or switch port and links to Cisco® bridge or router ports using Cisco Discovery Protocol.
- Tests cabling configuration and verifies connectivity.
- Checks for opens, shorts, miswires, split pairs, faults, and reverses.
- Wire maps network connections with remote identifiers.
- Displays length measurement for each pair in feet or meters.
- Conducts single-ended and remote cable tests.
- ♦♦ **WARRANTY** — 1 Year

With the LAN Solution GB Network Tester Kit, you get all the functions of a high-end cable tester and length measurement device plus the capabilities of a Gigabit network tester. You'll be able to identify, monitor, and correct problems associated with physical layer and link conditions in your network.

As a cable tester, the LanTest Pro provides complete cable testing functions. It displays wire map, ID, and any faults, including shorts, opens, miswires, split pairs, and reverses. You can also use the LanTest to measure cable length.

To test your network, the LanTest Pro gives you

a quick and easy way to identify active Ethernet, POTS, Token Ring, and other devices at unknown RJ-45 jacks. Use it to test for the presence of devices using power over Ethernet (PoE) at the other end of the jack or cable being tested. The LanTest Pro pings network devices to verify connections and IP addresses. It also automatically accesses DHCP hosts to obtain network information and identifies hubs, NICs, or Auto MDI/MDI-X devices. In addition, you can use the tester to identify the speed and capabilities of network drops.

LAN Solution Network Tester

The tester with advanced troubleshooting features for CATx and coax cable.

- Tests cable and monitors and corrects network problems with Physical Layer and link conditions.
- Checks for opens, shorts, miswires, and split pairs when doing simple testing with the tester and remote.
- Use to test CAT3, CAT5, CAT5e, or CAT6 UTP or STP cable.
- Also enables you to test coax cable (with coax connectors attached), map to remotes while cable testing, and select which pins have tone.
- Identifies port services like Ethernet, ISDN, POTS, and Token Ring.
- Reports speed, location, and capabilities of network devices.
- Pinging function verifies connections to devices and queries NICs.
- Detects Ethernet "phantom" power per IEEE 802.3af specifications and reports phone line current.
- Test up to eight connections with the kit.
- Maps to its remotes while cable testing.
- Battery supports 50 hours of continuous cable testing and 12 hours of continuous network testing.
- ♦♦ **WARRANTY** — 1 Year



TECH SPECS

Cable Types — CAT5/5e/6
Cable Test Lengths (Min.) — Split pairs: 3 ft. (1 m);
Single-ended cable test: 4 ft. (1.25 m);
Range: to 1500 ft. (0 to 457 m)
Temperature — Operating: +32 to +122° F (0 to +50° C);
Storage: -20 to +176° F (-30 to +80° C)
CE Approval — Yes
Power — (4) AA batteries, not included
Size — 1.8"H x 3.5"W x 7.3"D (4.5 x 8.9 x 18.6 cm)
Weight — 0.88 lb. (0.4 kg) with batteries

What's included

- Tester
- (9) remotes
- Tone tracer probe
- 1-ft. RJ-45 to alligator clips cable
- (2) 1-ft. RJ-45/RJ-45 cables
- (2) 7.5" RJ-12 to RJ-12 cables
- Nylon case

Item	Code	List Price
LAN Solution GB Network Tester Kit	TS5000A	\$799.95

What's included

- TS560A:**
- LAN Solution Network Tester
 - Remote
 - (2) 12" RJ-45/alligator-clip cable assemblies
 - (2) 12" UTP cables with RJ-45 connectors
 - (2) 7.5" cable assemblies with RJ-12 connectors for RJ-11 and RJ-45 jacks
 - Carrying case
 - 9-V alkaline battery
- TS565A:**
- All the above plus:
- (8) remotes
 - Tone tracer
 - (2) RJ-45-to-F type coax connectors



LAN Solution Network Tester Kit (TS565A)

Item	Code	List Price
LAN Solution Network Tester	TS560A	\$299.95
LAN Solution Network Tester Kit	TS565A	\$399.95

LanTest Pro GB Cable Tester Kit

A high-end cable tester for telecom and datacom applications.

- Use for installation, troubleshooting, and maintenance of telecom and datacom networks.
- Use on CAT5, CAT5e, CAT6, even coax lines.
- Measures cable length using a patented cable capacitance method.
- Tests and displays shorts, opens, miswires, reversals, and split pairs in wire map format with a remote.
- Identifies cable termination on active ports with blinking LEDs.
- Two-line, 16-character, backlit, full alphanumeric LCD with icon flags.
- Auto-off and timed backlight in any mode for low power consumption and long battery life.
- Determines condition of wires, too.
- Enables you to find and fix the position of exposed or hidden cable.
- ♦♦ **WARRANTY** — 1 Year

This all-in-one cable tester provides telecom, datacom, and cable installers and techs with cable testing, length measurement, and hub blink functions. Just push one button on this easy-to-use tester to initiate telco, network, and coax modes for diagnostic tests and results.

Use the LanTest Pro GB Cable Tester Kit to perform detailed cable analysis. When used without the remote, it tests and reports on shorts, opens, and split pairs conducted. When used with the remote, it detects miswires, no connections, shorts, high-resistance faults, and split pair conditions. The tester also measures cable length and displays a PASS icon for correctly wired T568A/B and six-pin cable. The MAP ID function

identifies multiple cables by displaying ID numbers of map-only remotes. The tone generator mode sends any of four user-selectable tones on all pin and pair combinations.

The main unit includes built-in RJ-11 and RJ-45 jacks for testing six- and eight-wire twisted-pair cable and an F-connector for testing coax cable. An integrated remote bay houses a detachable test remote with built-in jacks for testing twisted-pair cable terminated with RJ-11 or RJ-45 connectors. The kit also includes eight cable test remotes.

LanTest CAT5e Tester/Analyzer

Calculate cable lengths quickly and identify cable faults along the way.

- Determines cable length, identifies multiple faults, and shows clear PASS/FAIL results on an alphanumeric LCD screen.
- Tests for shorts, opens, miswires, reversals, and split pairs.
- Built-in tone generator.
- Auto-on feature synchronizes the test cycle to the type of connected cable and delivers results in seconds.
- Tests CAT3, CAT5, CAT5e UTP and STP.
- Test coax with adapters in the LanTest Pro CAT5e Tester/Analyzer Kit (TS875A).
- Customize to your application. Set test criteria for shielded cables or set the length constant to test in meters.
- You can even select which pins have tone and view an entire wire map on the screen—features not found on comparable testers.
- Kit also contains extra remotes for convenient testing of multiple runs.
- To trace tones, order the optional Network Probe (TS155-R3).
- ♦♦ **WARRANTY** — 1 Year



What's included

- Tester with built-in remote
- (7) cable test remotes
- 1-ft. RJ-45/alligator-clip cable assembly
- (2) 1-ft. RJ-45/RJ-45 cables
- 1-ft. coax cable
- Coax cable test remote
- Nylon case

Pro-Tip

Leave the guesswork to the amateurs. Black Box cable testers provide quick, accurate information that all cables installers need. Test for shorts, opens, miswires, and reversals. ID cables, generate tone, and measure length. Or choose one of our more advanced testers to check for PoE, display network speed, and more. Why work harder when you can work smarter?

TECH SPECS

Cable Length (Min.) — Pretest: 4 ft. (1.2 m);
Split pairs: 3 ft. (0.9 m);
Length measurement range: CAT5/6: 0 to 2000 ft. (0 to 610 m)

Cable Types — Shielded or unshielded twisted pair and coax

Environmental — Operating temperature: 32 to 122° F (0 to 50° C)
Storage temperature: 14 to 140° F (10 to 60° C)
Humidity: 10 to 90%, noncondensing

CE Approval — Yes

Power — (1) 9-V battery, not included

Size — Excluding F-connector: 1.3"H x 2.6"W x 6.2"D (3.3 x 6.7 x 15.7 cm)
Including F-connector: 1.3"H x 2.6"W x 6.6"D (3.3 x 6.7 x 16.8 cm)

Weight — 0.5 lb. (0.2 kg) with battery and remote

Item	Code	List Price
LanTest Pro GB Cable Tester Kit	TS4000A	\$299.95

TECH SPECS

Cable Test Lengths — Maximum: 2500 ft. (762 m);
Minimum: For split pairs: 3 ft. (0.9 m);
For pretest: 4 ft. (1.2 m)

CE Approval — Yes

Power — 9-V battery (included)

Size — 5.7"H x 2.9"W x 1.2"D (14.5 x 7.4 x 3 cm)

Weight — With battery installed: 0.4 lb. (0.2 kg)

Item	Code	List Price
For testing cable to a single point, order... LanTest CAT5e Tester/Analyzer (1 Remote)	TS870A	\$184.95

For multipoint testing, order... LanTest Pro CAT5e Tester/Analyzer Kit (8 Remotes)	TS875A	\$289.95
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LanTest Pro CAT5e Tester/Analyzer Kit (TS875A)

Item	Code	List Price
For tracing tones, order... Network Probe	TS155-R3	\$56.95

Copper

CAT5/5e/6 LAN Performance Verifier

Digitally certify UTP cables and devices in Gigabit Ethernet networks—and do it on a budget!

- Verify that UTP cables and LAN hardware perform at the promised speeds!
- Level 1 and Level 2 certifications.
- High-speed TDR provides nanosecond-accurate results.
- Locates opens, shorts, and splits—and pin-points the exact distance to the fault or split.
- Converts test results into graphs that show the cable's speed capability (CAT3/5/5e/6).
- Use to test in-line between two devices to determine the autonegotiated speed.
- Tests 10-, 100-, and 1000-Mbps devices for data signal levels.
- ♦♦ **WARRANTY** — 1 Year



NOTE: Not recommended for use with shielded cable. Use with 4-pair, unshielded twisted-pair cable only.

What's included

- LAN Performance Verifier
- Probe unit
- (2) CAT5e cables
- Test summary tablet
- "Passed" stickers
- 6-ft. serial data cable
- Software CD
- (2) 9-volt batteries
- (1) coax to RJ-45 adapters
- User manual
- Zippered case

Item	Code	List Price
CAT5/5e/6 LAN Performance Verifier	TS580A-R3	\$625.95

TVR 10/100/1000 Tester

Get big 10BASE-T, 100BASE-TX, and 1000BASE-TX hand-held testing with a small price tag!

- Performs verification for 10BASE-T/100BASE-TX/1000BASE-TX hubs and PCs.
- Indicates the negotiated speed and duplex between two LAN devices.
- Simulates straight-through or crossover cable.
- Locates cables or hub ports using the included remote probe to detect a tone generated by the hand-held tester.
- Verifies terminated pairs in hubs or PCs, wired pairs, and pair reversals.
- For more information, see blackbox.com.
- ♦♦ **WARRANTY** — 1 Year



Tester Remote Probe

TECH SPECS

CE Approval — Yes

Connectors — (4) RJ-45 jacks on tester

Indicators — Tester: (15) LEDs;
Remote: (4) LEDs

Power — (2) 9-V alkaline batteries (included)

Size — Tester: 5.5"H x 3.3"W x 1"D
(14 x 8.4 x 2.5 cm);
Remote: 7"H x 1"W x 0.8"D (17.8 x 2.5 x 2 cm)

Weight — 0.5 lb. (0.2 kg)

Item	Code	List Price
TVR 10/100/1000 Tester	TS029A-R4	\$249.95
♦ Includes the tester and remote probe units, (2) 9-V batteries, (2) RJ-45 to RJ-45 jumper cables, (1) protective felt carrying case, and (1) user's manual.		

SOHO Tester

All you need to test your small office or home office wiring systems.

- Designed exclusively for low-voltage cables commonly used for home networking and home automation.
- Handheld unit reliably tests 8-wire network cables, 6-wire telephone lines, cable TV, audio cables, and more.
- Test for shorts, opens, miswires, reversals, and split pairs in any of its three test modes (telephone, coax, and network).
- Identifies remote while testing the cable.
- Displays the wire map and any faults associated with the various cable types.
- Get clear pass/fail results on a large seven-segment LCD with a backlight.
- A tone mode generates audio tones for use with tone probes on all pairs, a selected pair, or a selected pin.
- Order extra Coax Remote Identifiers as well as RJ-45 or RJ-11 Wire Mappers for identifying and mapping multiple points of termination.
- ♦♦ **WARRANTY** — 1 Year



Item	Code	List Price
SOHO Tester	TS590A	\$110.95
♦ Includes (1) local unit, (1) remote unit, (1) Coax Remote Identifier, (1) 12" RJ-45-to-alligator clip cable, (1) 7.5' cable with RJ-12 connectors for RJ-45 or RJ-11 jacks, and (1) user's manual.		
You may also need...		
Coax Remote Identifiers, 20-Pack	TS591	\$56.95
Wire Mappers, 20-Pack		
RJ-45	TS592	\$38.95
RJ-11	TS593	\$38.95

Wi-Net Detector

Want to know the best place to put your wireless components? This lightweight detector gives you a clear picture.

- A must-have for installers and wireless network operators who need to identify and configure transmission equipment at a site.
- Supports interactive operation with wireless networks that have 64- or 128-bit Wired Equivalent Privacy (WEP) encryption.
- Picks up all IEEE 802.11a, b, and g signals.
- Provides critical information on where components are located.
- Constantly scans for wireless transmissions.
- Full alphanumeric LCD shows info clearly.
- Helps prevent Web access conflicts.
- Features audible pickup signal alerts.
- Displays encryption condition.
- Lists each signal as either an access point or an ad-hoc or a twin network type signal.
- Gives a clear picture of the range and availability of each access point.
- Ping function enables you to access IP addresses and determine an Internet link condition.
- Negotiates with network DHCP to identify components and IP/MAC addresses.
- Shows router, DNS, and target info.



- ♦♦ **WARRANTY** — 1 Year

Item	Code	List Price
Wi-Net Detector	TS950A	\$249.95

Copper

Net Tone • Net Tone Plus

Locate cable runs and test for continuity and voltage.



TS300A



TS400A

Net Tone

- A must-have tool when you're working in a telco or network environment.
- Place the tone generator on one end of the cable and use the tone probe to find the other.
- Make connections to RJ-11 and RJ-45 jacks and to any wire pair using alligator clips.
- Tests for shorts in the cable and the presence of voltage.
- Works on both Ethernet and telco cabling.
- Switch-selectable tone and large LED display.
- Tone Probe has ultrabright LED tip for visibility in dark spaces, filtered circuitry for elimination of fluorescent hum, and safety LED.
- Tone Probe also has volume control and insulated tip to stop accidental shorts when probing punchdown blocks.
- ♦♦ **WARRANTY** — 1 Year

What's included

- Tone generator with cable
- Probe
- Carrying pouch
- (2) 9-V batteries

Item	Code	List Price
Net Tone	TS300A	\$99.95
Power Panel CAT5/CAT6 DVM and Network PoE Tester (For details, see blackbox.com .)		
	TS150A-R2	\$159.95



LanScope, pp. 4–5.

Net Tone Plus with PoE Capabilities

- Trace and locate cable ends or port terminations. Connections can be made to RJ-11 and RJ-45 jacks, to any wire pair using alligator clips, or to coax cables using the included adapter.
- Large LCD screen displays the speed and cable location of active network devices, the voltage and cable location of phone devices and PoE, and the power draw of PoE devices.
- Tests for shorts in the cable and the presence of voltage.
- Can be used to simulate a PoE device.
- Locates active network devices, including VoIP phones, IP cameras, access points, switches, and NIC cards.
- Also locates phones, faxes, modems, and PBXs.
- Displays advertised and negotiated speeds, duplex, and location on cable.
- Port beacon mode for port detection.
- ♦♦ **WARRANTY** — 1 Year

What's included

- Power panel with tone generator
- Probe
- RJ-45 to alligator clip cable
- Patch cable
- RJ-45 to coax adapter
- Carrying pouch
- (2) 9-V batteries

Item	Code	List Price
Net Tone Plus	TS400A	\$199.95

Pro-Tips

Eavesdrop on your network.
Want to sniff out snoopers? Invest in a network tap. They're your portal to quiet and

unobtrusive network monitoring. You can leave them in permanently and then attach monitoring equipment, such as the LanScope (pages 4–5).

Copper Taps • Copper Aggregators • Optical Taps

Monitor high-speed copper or fiber links with no network disruption or downtime.

- Get an accurate view of your copper or fiber optic network.
- Provide a complete copy of data from full-duplex network links.
- Operate transparently and don't block error packets.
- Provide passthrough signals.
- Can be left in place permanently.
- Connect and disconnect monitoring devices without disruption.
- Use with network and protocol analyzers, security monitoring devices, RMON probes, and more.
- Copper Tap model has separate transmit and receive channels; Aggregator models combine streams for dual monitoring.
- Provide continuous data flow if the power fails.
- ♦♦ **WARRANTY** —1 Year



TS250A

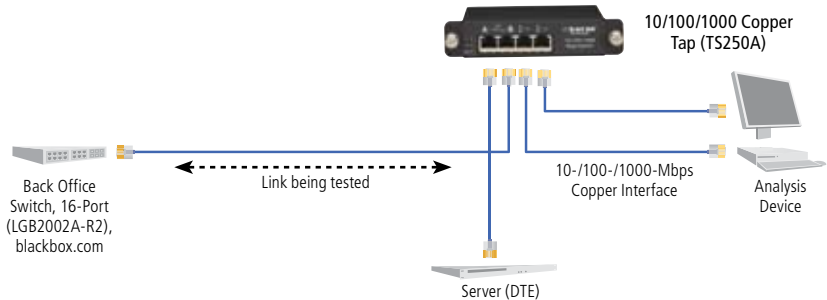
The **10/100** and **10/100/1000 Copper Taps** autonegotiate for speed and provide a complete copy of the data from a full-duplex copper link to your network analyzer. The tap operates passively and works regardless of traffic levels.

If you want to monitor, transmit, and receive data streams at the same time, choose a **10/100/1000 Copper Aggregator**. It combines, transmits, and receives data streams so you can see them together without switching from one to the other. Choose between models with either a 256 or 512 MB buffer. Need a larger buffer? Order the **1-GB Aggregator Tap**, which reduces the chance of dropped packets on Gigabit links.

For fiber optic monitoring, use the **Optical Taps** on either side of the full-duplex link being tested and a standard full-duplex analyzer connection.

Optical Taps have LC connectors and split the full-duplex signal in 50/50 ratios from the network into two signals, sending one back to your network and the other to your monitoring device (a dual-receive capture card is required). For fiber optic applications where you need to monitor links running 10-Gigabit Ethernet (10-GbE) traffic, order the **10-GbE Optical Tap**.

The **Rackmount Bracket** holds up to three taps or aggregators.



Item	Code	List Price
10/100 Copper Tap	TS230A-R2	\$349.95
10/100/1000 Copper Tap	TS250A	\$849.95
10/100/1000 Copper Aggregators		
256 MB Buffer	TS254A	\$1495.95
512 MB Buffer	TS255A	\$1995.95
1-GB Aggregator Tap	TS256A	\$2499.95

Item	Code	List Price
Single-Channel Optical Tap, 50/50 Split Ratio		
Multimode 50-µm	TS243A	\$349.95
62.5-µm	TS240A-R2	\$349.95
Single-Mode 9-µm	TS244A	\$349.95
10-GbE Optical Tap, 50/50 Split Ratio		
Multimode 50-µm	TS245A	\$449.95
Single-Mode 9-µm	TS246A	\$449.95
Rackmount Bracket, 19", 1U	TS253	\$69.95

Copper

Fluke Networks DTX CableAnalyzer 1800
Significantly reduces total certification costs!

- Test CAT5e, CAT6, CAT6a, Class C, D, E_A, and F.
- Tests with ISO Accuracy Level IV and TIA Level IIIe.
- Meets CAT6a 568-C.2 standards.
- The 9-second CAT6 autotest is three times faster than standard testers.
- Tests CAT6a and Class F links in 22 seconds.
- Use on STP, FTP, SSTP, and UTP cabling.
- Independently verified by the UL® to meet ISO Level IV and proposed TIA Level IIIe Accuracy requirements.
- Analyze test results with LinkWare™ software.
- Optional fiber modules enable you to switch easily between copper and fiber.
- Fast, reliable, and rugged with extended 12-hour battery life and color display that enhance user productivity.
- ♦♦ **WARRANTY** — 1 Year

Fluke Networks' DTX CableAnalyzer™ combines speed and unprecedented accuracy no other certification tester can match. This revolutionary future-proof platform significantly reduces total certification time by improving every aspect of the testing process. You can see the time savings on your bottom line—as much as 33% of certification costs per year.

With the 9-second CAT6 autotest, you can meet TIA-568-C and ISO 11801:2002 certification requirements faster than ever before. And this speed also comes with increased accuracy. The DTX is the only independently verified tester to obtain UL® classification for ISO Accuracy Level IV. The AC Wiremap feature validates twisted-pair cabling for Power over Ethernet services in accordance with TIA/EIA standards, even if a midspan power supply is used.

The DTX also gives you 900 MHz of testing bandwidth, optional on-board fiber modules, easy-to-understand diagnostics, 12-hour battery life, a bright color display, and nearly instant setup and reporting.

Test standards include:

- TIA CAT3, 5e, 6 per ANSI/TIA-568-C.2
- TIA CAT5 (1000BASE-T) per TIA TSB-95
- TIA CAT6 per TIA/EIA-568-B.2-1
- TIA CAT6a per ANSI/TIA-568-C.2
- TIA TSB-155
- TR 24750



- ISO/IEC 11801 Class C, D, E, E_A, F
- EN50173 Class C, D, E, E_A, F
- ANSI TP-PMD
- IEEE 802.3 10BASE-T, 100BASE-TX, 1000BASE-T
- IEEE 802.3an 10GBASE-T

TECH SPECS

- Calibration** — 1 year
Delay Skew — 0 to 100 ns, ± 10 ns
Link Test Modes — Exceeds Level III requirements of ANSI/TIA-1152 and IEC 61935-1/Ed.3 (CAT6a/Class E_A); Exceeds Level IV as in IEC 61935-1/Ed.3
Length — Single-ended test: 800 m (2600 ft.); 0.1 m (1 ft.) resolution ± 1 m, 4% accuracy; Dual-ended test (main and remote): 150 m (490 ft.); 0.1 m (1 ft.) resolution ± 1 m, 4% accuracy;
Power — Lithium-ion battery pack: 7.4 V, 4000 mAh; Typical battery life: 12 to 14 hours; AC adapter/charger
Size — 8.5"H x 4.4"W x 2.4"D (21.6 x 11.2 x 6 cm)
Weight — 2.4 lb. (1.1 kg)

Item	Code	List Price
Fluke Networks DTX CableAnalyzer 1800	DTX1800 120	\$9115.00
♦ Includes (1) DTX-1800 Main unit, (1) Smart Remote, LinkWare™ PC software, 128 MMC card, (2) CAT6a/Class E _A permanent link adapters, (2) CAT6/Class E channel adapters, (2) headsets, (2) AC chargers, (1) USB interface cable, (1) serial RS-232 cable, and (1) user's manual.		

Fluke Networks EtherScope Network Assistant

Your fast assistant for LAN and Wi-Fi® installation and troubleshooting.

- The essential tester for network first responders.
- Provides Gigabit and wireless LAN troubleshooting.
- Offers 10/100/1000 copper and fiber LAN analysis.
- Provides 802.11 wireless LAN analysis.
- Monitor network traffic and switch interfaces.
- Discover wired and wireless infrastructure devices and configurations.
- Validate LAN services availability and responsiveness.
- Measure Ethernet performance.
- ♦♦ **WARRANTY** — 1 Year



The EtherScope™ Series II Network Assistant is a handheld 10/100/1000 and 802.11 wireless LAN analyzer that assists frontline IT professionals with Ethernet performance measurement, network installation, LAN validation, and troubleshooting. It combines essential tools that help network professionals quickly solve the wide range of problems they encounter.

LAN and Wi-Fi network installers rely on the EtherScope analyzer to complete projects on-time and within budget. Whether it's testing and troubleshooting during the installation or upgrade, or validating LAN operation by verifying network services and measuring Ethernet performance after the install, the EtherScope is up to the task.

Quantify and document Ethernet performance to establish a baseline, to demonstrate performance after a network upgrade, or to verify an SLA. Measure end-to-end throughput, latency, frame loss, jitter, and bit errors at rates up to 1 Gigabit. Easily interpret test results with pass/fail thresholds.

Install wired and wireless LANs and complete projects on time with fewer problems by testing as you go. This way you can ensure each step of the project is correctly installed and configured. Test cabling, verify and edit switch and access point configurations, and confirm network connectivity and availability of key services.

Validate LAN installations as the final step in completing a project. Combine the Ethernet Performance Tests and the Service Performance Tool for quick and easy LAN validation with pass/fail results.

A comprehensive set of LAN and WLAN tests help first responders analyze, isolate, and solve LAN and WLAN problems fast, or at least prove the problems aren't on the network.

TECH SPECS

Cable Length — 1 to 305 m (3 to 1000 ft.), accuracy dependent on the cable type selected

Compatible Remote Devices — MetroScope, LinkReflector, EtherScope, hardware loopback

Display — LCD touch screen

Connectors — (1) USB, (1) PCMCIA/Cardbus (PC Card Type II), (1) SFP cage, (1) CompactFlash™ (Card Type I/II), (1) DB9 serial, (1) headphone jack, (1) microphone jack, (1) Kensington® lock receptacle, (1) RJ-45 10/100/1000BASE-T Ethernet port, (1) SFP port, (1) duplex LC

Indicators — (6) LEDs

Power — Lithium-ion battery: 7.2V DC, 4.2 Ah, removable/rechargeable;

Typical battery life: 4 hours;

Standby mode: 10 hours;

AC input: 90–264 V, 48–62 Hz; 1.5 A;

DC output: 15 V, 1.2 A;

Auto charger: 12V charger with 6-ft. (1.8-m) coiled cord and LED power indicator

Size — 7.5"H x 6"W x 1.75"D (19.1 x 15.2 x 4.4 cm)

Weight — 1.9 lb. (0.9 kg)

Item	Code	List Price
Fluke Networks EtherScope Network Assistant	ES2-LAN-SX	\$6995.00

F3X Fiber Fault Finder Gun

Be a fiber spy. Point and shoot to detect leaks in your network.



The F3X Fiber Fault Finder Gun is all you need to find leaks in fiber cable up to 300 kilometers away. F3X shown with High-Power Light Source (F3XLS2), Aerial Filter and Scope (F3XAFS), and Hard Carrying Case (F3XCASE).

- Just point and shoot to detect leaks, breaks, and bends in fiber cable.
- Identify fibers up to 300 kilometers away.
- Pinpoint faults to within inches.
- Use in premise and outdoor applications.
- Find breaks indoors and outdoors, even in bright daylight.
- Identify aerial breaks and leaks from the ground.
- Uncover bad splices and connector loss.
- Locate signals through bulkheads, patch panels, even dust caps.
- See faults with dark blue, green, and black coated fibers.
- Find breaks in dark fiber.
- Works where VFLs don't, even in OTDR dead zones.
- Gives an audio/visual fault indication.
- ♦♦ **WARRANTY** — 1 Year

Suspect your fiber network is compromised? Do some fiber espionage with the F3X Fiber Fault Finder Gun. Use this infrared light detection probe to gather the intelligence you need to ID leaks, breaks, bends, and faults in your fiber network.

You'll save hours of your time in troubleshooting and hours in network downtime, saving your organization tens of thousands of dollars in lost productivity. With this new patent-pending technology, you'll be able to pinpoint faults in your fiber network to within inches.

Point and shoot.

To find leaks, just point your F3X Gun at your fiber cable run and squeeze the trigger. Then sweep it over the fiber. Get ready to be amazed. The F3X can actually see light emanating from any faults, breaks, and bends in the cable. It works in bright daylight, too, eliminating the need to turn off the lights or wait until nightfall to work on outdoor cable.

In the closet, you'll be able to uncover hard-to-find light loss points in connectors mated in bulkhead adapters, patch panels, boots, fanouts, even some dust caps.



The F3X is so sensitive and versatile you can use it in bright daylight to detect faults. No need to wait until dark or to block out ambient light.

With the F3X Fiber Fault Finder Gun, you'll find problems that you previously were unable to diagnose with traditional methods. It offers far more functionality than a visible laser light source. Plus you can use it in OTDR dead zones and in splice enclosures where it's critical to pinpoint the exact location of faults. Once the gun detects a light loss point, it gives you an audio/visual fault indication.

The F3X is great for troubleshooting all fiber networks. But it's particularly beneficial for mission-critical and secure fiber networks, such as in government, military, education, healthcare, finance, etc.

Highly sensitive to signals.

The F3X is so sensitive, it will pick up light signals other fault finders can't—saving you a bundle of time. Use it to pinpoint faults through most jacket types and buffer colors. It will even uncover leaks in fibers with dark blue, green, and black coats.

The F3X can also identify damaged splices through the splice jacket. And it can pick up signals from bends several times more gentle than those induced by many fiber identifiers.

The F3X can also help you locate inefficient and poorly mated connectors, bad splices, and much, much more.

Upper-level leaks.

Think you have a leak or fault in an overhead fiber line? Before you pull out the ladder, pull out the F3X.

For aerial operations inside and out, choose the optional **F3X Aerial Filter and Scope** (page 21). Attach them to your F3X Gun and you have everything you need to quickly find leaks in overhead lines. What was once impossible is now possible. All you need to do is point and shoot.

The filter, scope, and gun can detect cable damage from excessive bends, rodents, and even shotgun pellets from more than 100 feet away. Best of all, they work in sunshine and bright indoor light, including industrial bays with high ceilings. There's no need to wait until dark or to turn the lights out. The F3X will find the leak.

Surveillance operations.

The F3X is so versatile, you can use it to do the following:

- **Raw fiber identification.** (End and side access. Long and short distances.) Find fiber in a bundle when you have access to the fiber ends.
- **Connector panel port identification.** (Short and long distances.) Find a port in a patch panel by scanning the face of the box. You don't need internal access, clamping devices, or bare fiber adapters. (Continued on page 20.)

For more details and pricing, turn the page.



F3X Fiber Fault Finder Gun (Continued)



Outfit your F3X Fiber Fault Finder Gun with an Aerial Filter and Scope, and all you need to do to detect leaks in overhead fiber is point and shoot.

- **Bent and broken fiber leak detection.**

Locate bends and fractures in bright indoor and outdoor light without the need to block ambient light. Because of its infrared operation, the gun works with many blue, green, and black buffer coatings that can block visible red laser light.

- **Connector end-face splatter detection.**

Probe connectors from the side and ID damaged end faces by the light that is splattered—without using a microscope.

- **Ceramic ferrule fractures or misalignments.** Probe connectors from the side to detect sub-surface fractures inside the ferrule. This is particularly useful with anaerobic adhesive connectors.

- **Epoxyless connector leak detection.**

Identify inefficient internal splices by sensing light leaking through the ferrule or the connector.

- **Mechanical or fusion splice leak detection.** Scan splices from the side to identify damaged splices, leaks, and light scatters. Because of its infrared operation, the F3X Gun can outperform visible laser sources.

- **Bulkhead adapter alignment.** Scan bulkhead adapters in patch panels to locate light scatters from worn or fractured alignment ferrules.

- **Patch panel adapter failures and raw fiber ID.** (Side access.) Scan the secondary side

of connectorized bulkhead adapters to locate light scatters from worn or fractured alignment ferrules.

- **Splitter troubleshooting.** Identify where visible lasers do not function by scanning the secondary side of splitters.

Three MOs.

Use the F3X in three modes of operation:

1. **Raw infrared light detection.**

Detect infrared light including traffic, tracer signals, and CW light. This enables you to locate severe bends and breaks in lightly colored fibers.

2. **2-kHz remote tracer source light detection.**

Examine ports, fibers, splices, or connectors for the presence of a 2-kHz modulated signal. Any light between 1000–1700 nm will be detected. This method also enables you to ID light at uncovered ports up to 300 kilometers away or to locate severe bends and breaks in most 250- or 900- μ m buffered fibers.

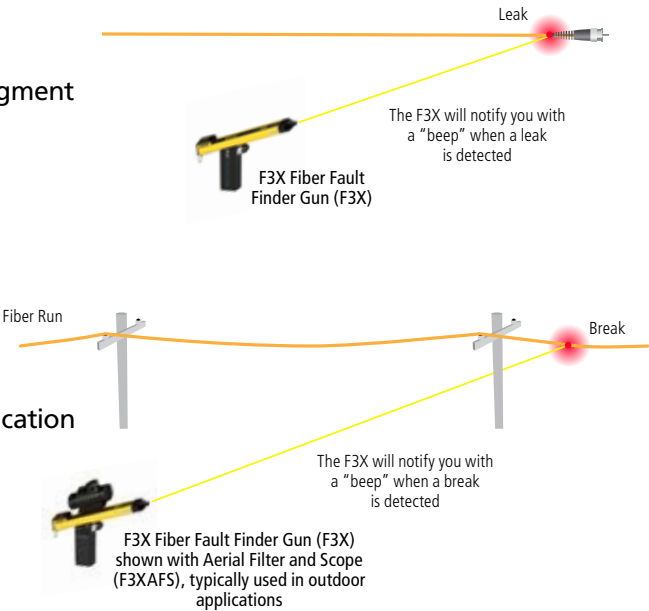
3. **Local tracer source detection.**

In this mode, the F3X Gun senses light from its own internal source at the rear of the unit. This is the most sensitive mode of operation. Use it to detect breaks in nearly all 250- and 900- μ m fibers, usually at the ends of a cable at the ports, splices, and connectors.



For more details, turn the page.

Fiber Cable Segment



Outdoor Application

Customize your F3X Gun.

The F3X system consists of the Fiber Fault Finder Gun and multiple light sources and filters that are sold separately. This way, you can build the kit you want based on your fiber network. Choose from the following:

Light sources

Use the medium-powered [Light Source 1](#) for local operations. Choose the high-powered [Light Source 2](#) for long-distance applications up to 300 kilometers (186.4 mi.).

Both light sources feature 1550-nm operation and a standard 2-kHz modulation used by the gun and most fiber identifiers. (The sources do not operate in continuous wave [CW] mode.) They're powered by either four AA alkaline batteries or an AC wall pack with four AA NiMH cells. The wall

pack and four NiMH cells are included.

For durability, the sources have aluminum cases with high-impact rubber bumpers.

Filters

The filters come in specific wavelengths, so you can choose the one that's right for your application. The [Standard Filter](#) works with all fiber wavelengths from [1280-nm–1680-nm](#). Or you can choose filters specifically for [1310-nm](#), [1490-nm](#), or [1550-nm](#) wavelengths.

For aerial operations, choose the [Aerial Filter and Scope](#).

Accessories

An optional waterproof [Hard Carrying Case](#) includes a foam insert to hold the F3X Gun and other accessories securely.

For easy field use, order the optional [Holster](#).

TECH SPECS

F3X, F3XLS1–F3XLS2:

Bandwidth — 5 nm

Emitter — Laser

Modulation — F3X: 500 Hz;

F3XLS1–F3XLS2: 2 kHz

Stability — F3X: 0.20 dB/8 hrs.;

F3XLS1–F3XLS2: 0.10 dB/8 hrs.

Spectral BW (Typical) — 5 nM

Temperature — Operating: +23 to +113° F

(-5 to +45° C);

Storage: +14 to +140° F (-10 to +60° C)

Wavelength — 1550 nm

Pout — F3XLS1: -3 dBm;

F3XLS2: +5 dBm

Power — Operating: F3X: (1) 9-V alkaline battery;

F3XLS1–F3XLS2: (4) AA NiMH batteries (included)

or (4) AA alkaline batteries

Item	Code	List Price
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First order the gun...

F3X Fiber Fault Finder Gun	F3X	\$2295.00
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◆ Include: (1) F3X fiber optic leak detector pistol probe, (1) 9V battery, and (1) user's manual.

...next, order a light source.

F3X Laser Light Sources		
1: Medium Power	F3XLS1	\$995.00
2: High Power	F3XLS2	\$1995.00

You may also need:

Filters		
1280 nm–1680 nm	F3XFSTD	\$349.00
1310 nm	F3XF-1310NM	\$449.00
1490 nm	F3XF-1490NM	\$449.00
1550 nm	F3XF-1550NM	\$449.00
Aerial Filter and Scope	F3XAFS	\$795.00
Hard Carrying Case	F3XCASE	\$169.00
Holster	F3XH	\$159.00

Light Sources

Choose the right light for you: basic for occasional testing, deluxe



FOLS-SM-100



FOLS-MM-100

Basic Light Sources

These basic light sources are ideal for the data center and occasional fiber testing.

- Operate in continuous wave (CW) or modulated mode.
- Choose from three output frequencies: 270 Hz, 1 kHz, and 2 kHz.
- Include a rechargeable lithium ion battery and an AC adapter.
- An auto-off feature saves battery power.
- Low-battery indicator reminds you to recharge the battery.
- A single-output connector provides stable power at dual wavelengths.
- An LCD backlight enables you to work in the dark.
- Include a FC/PC interchangeable connector.
- Compact units are lightweight and easy to carry.
- Work with our Basic Fiber Optic Power Meter (pages 24–25) to measure optical loss.

Deluxe Light Sources

Auto wavelength recognition and adjustable power save you valuable testing time.

- Auto wavelength recognition automatically uses the proper calibration parameters.
- Adjust the output power up and down in 0.1 dB increments from -2 to -8 dBm, reducing errors and communication time between two techs.
- Operate in continuous wave (CW) or modulated mode.
- Choose from three output frequencies: 270 Hz, 1 kHz, and 2 kHz.
- Advanced light source is ideal for testing long-haul runs.
- A single-output connector provides stable power at dual wavelengths.
- Include two NiMH AA rechargeable batteries and an AC adapter.
- An auto-off feature saves battery power.
- Low-battery indicator reminds you to recharge the battery.
- An LCD backlight enables you to work in the dark.
- Include a FC/PC interchangeable connector.
- Compact units are lightweight and easy to carry.
- Work with our Deluxe Fiber Optic Power Meter (pages 24–25) to measure optical loss.



F3X Fiber Fault Finder Gun,
pp. 18–21.

- ♦♦ **WARRANTY** — All: 2 Years

for advanced field testing.



FOLS-SM-200



FOLS-MM-200

TECH SPECS

Adjustable Range — Deluxe models only: ± 3 dB, 0.1 dB/ steps

Auto Power-Off — Yes

Backlighting — Yes

Central Wavelength — Single-Mode: 1310 ± 20 nm, 1550 ± 20 nm;

Multimode: 850 ± 10 nm, 1300 ± 20 nm

Emitter Type — Laser Diode (LD)

Fiber Type — Single-mode or multimode

Laser — Class 1

Output Frequency — 270 Hz, 1 kHz, 2 kHz

Output Power — -5.0 dBm ± 1 dB

Output Stability* —

Basic models:

Short term (15 minutes): less than 0.1 dB;

Long term (5 hours or more): less than 0.2 dB;

Deluxe models:

Short term (15 minutes):

Single-mode: less than ± 0.05 dB at 1310 and 1550 nm;

Multimode: ± 0.1 dB at 850 and 1300 nm;

Long term (5 hours):

Single-mode: less than 0.1 dB at 1310, 1550 nm;

Multimode: ± 0.2 dB at 850 and 1300 nm

Output Wavelength (nm) —

Single-mode: 1310 nm, 1550 nm;

Multimode: 850nm, 1300 nm

Spectral Width — 5 nm

Connectors — FC/PC, SC/PC, ST/PC interchangeable connectors

Temperature — Operating: $+14$ to $+122^\circ$ F (-10 to $+50^\circ$ C); Storage: -4 to $+155^\circ$ F (-20 to $+70^\circ$ C)

Power — Lithium ion rechargeable battery (included), AC adapter (included);

Deluxe models: (2) Ni-MH (AA) rechargeable batteries (included), AC adapter (included)

Size — Basic models: $4.5''$ H x $2.5''$ W x $1.2''$ D (11.4 x 6.4 x 3.1 cm);

Deluxe models: $6.3''$ H x $3''$ W x $1.8''$ D (16 x 7.6 x 4.5 cm)

Weight — Basic models: 0.31 lb. (0.14 kg);

Deluxe models: 0.6 lb. (0.3 kg)

* Valid at 1550 nm, CW, 73° F $\pm 5^\circ$ F (23° C $\pm 5^\circ$ C); Relative humidity: less than or equal to 70% with an FC connector

Pro-Tips

Test before you pull.

One of the first things you should do when working on a new fiber installation is test the fiber on the reel. Use a visual light source or fault locator to check for kinks, cracks, and breaks in the cables. If there's a problem, you'll know it before you spend a lot of time and money on installation.

Item	Code	List Price
Basic Light Sources		
Single-Mode	FOLS-SM-100	\$1195.00
Multimode	FOLS-MM-100	\$795.00
Deluxe Light Sources		
Single-Mode	FOLS-SM-200	\$2035.00
Multimode	FOLS-MM-200	\$1695.00

You may also need...

Single-Channel Optical Tap, 50/50 Split Ratio			
Multimode	50-μm	TS243A	\$349.95
	62.5-μm	TS240A-R2	\$349.95
	9-μm	TS244A	\$349.95
10-GB Optical Tap, 50/50 Split Ratio			
Multimode	50-μm	TS245A	\$449.95
	9-μm	TS246A	\$449.95
Rackmount Bracket, 19", 1U			
		TS253	\$69.95

(For more information on Fiber Taps, see blackbox.com. For Copper Taps, see p. 15.)



Power Meters

Choose your power level: basic for occasional testing all the way up



FOPM-100



FOPM-200



FOPM-210

Basic Optical Power Meter

- Use to identify optical fiber strands, measure optical attenuation, verify continuity, and test transmission quality.
- This basic power meter is ideal for data centers, labs, and occasional fiber testing.
- Works at six wavelengths: 850, 1300, 1310, 1490, 1550, and 1625 nm.
- Detects and adjusts to different frequencies automatically.
- Referencing function helps ensure efficiency, even when two units are far apart.
- An auto-off feature saves battery power.
- Includes a rechargeable lithium ion battery and an AC adapter.
- Low-battery indicator reminds you to recharge the battery.
- LCD backlight enables you to work in the dark.
- Features a linear and logarithmic power display.
- Includes an FC/PC interchangeable connector.

Deluxe Optical Power Meter

- Get all the features of the Basic model, plus:
- Auto wavelength recognition automatically uses the proper calibration parameters and decreases the potential for errors.
- Ideal for testing transmission quality in LANs, WANs, telecommunications networks, and other long-distance applications.

Deluxe Optical Power Meter with Memory

- Get all the features of the Deluxe model, plus:
- Boasts a data storage capacity of 999 items.
- Transfer data to a PC via a USB connection.
- With the included software, data can be saved as an Excel® file or plain text.
- All work with our fiber Light Sources (pages 22–23) to measure optical loss.
- ♦♦ **WARRANTY** — All: 2 Years

FOPM-100, -200, -210:

Auto Power Off — Yes

Accuracy* — FOPM-100: ± 0.35 dB ± 10 nW;
FOPM-200, FOPM-210: $\pm 5\%$ ± 1 nW

Backlight — Yes

Calibrated Wavelength — 850, 1300, 1310,
1490, 1550, 1625 nm

Detector Type — InGaAs

Frequency — 270 Hz, 1 kHz, 2 kHz

Measuring Range — FOPM-100: -60 to +3 dBm;
FOPM-200, FOPM-210: -70 to +10 dBm

Reference Value — Yes

Resolution — FOPM-100: 0.01 dB;
FOPM-200: 0.01 dB @ -60 to +10 dBm;
0.1 dB @ -70 to -60 dBm;
FOPM-210: 0.01 dB

Temperature — Operating: +4 to +122° F
(-10 to +50° C);

TECH SPECS

Storage: -4 to +158° F (-20 to +70° C)

Connectors — All: FC/PC (SC/PC, ST/PC interchangeable connector;

FOPM-210: USB

Power Supply — FOPM-100: (1) lithium ion battery, AC adapter;
FOPM-200, FOPM-210: (2) 1.2-V Ni-MH batteries, AC adapter

Size — FOPM-100: 1.2"H x 2.4"W x 4.5"D
(3.0 x 6.2 x 11.5 cm);

FOPM-200: 4.6"H x 3"W x 1.8"D (11.6 x 7.6 x 4.5 cm);

FOPM-210: 6.3"H x 3"W x 1.8"D (16 x 7.6 x 4.5 cm)

Weight — FOPM-100: 3.1 lb. (1.4 kg);
FOPM-200, FOPM-210: 0.6 lb. (0.3 kg)

*Valid at 1550 nm, CW, 23° C $\pm$ 3° C; Relative humidity equal to 70%, with an FC connector.

to a combo meter/light source for advanced field testing.



FOMM-200

Power
meter and
light source
in one!



Fiber Light Sources,
pp. 22–23.

Deluxe Optical Power Meter with Memory and Light Source

- Get a power meter and 3-wavelength infrared laser light source in one.
- This compact combo for fiber installation and maintenance is easy to use and lightweight.
- 2-in-1 unit is ideal for one tech to test cables and data center links.
- Auto wavelength recognition automatically uses the proper calibration parameters and decreases the potential for errors.
- Boasts a large data storage capacity of 999 items.
- Convenient for field testing and later transferring the results to a PC.
- Includes software and a USB interface.
- Interchangeable connectors available for both power meter and laser source.
- ♦♦ **WARRANTY** — 2 Years

Item	Code	List Price
Optical Power Meters		
Basic	FOPM-100	\$445.00
Deluxe	FOPM-200	\$695.00
with Memory	FOPM-210	\$975.00
with Memory and Light Source	FOMM-200	\$2975.00

You may also need...

Single-Channel Optical Tap, 50/50 Split Ratio		
Multimode 50-μm	TS243A	\$349.95
62.5-μm	TS240A-R2	\$349.95
Single-Mode 9-μm	TS244A	\$349.95
10-GB Optical Tap, 50/50 Split Ratio		
Multimode 50-μm	TS245A	\$449.95
Single-Mode 9-μm	TS246A	\$449.95
Rackmount Bracket, 19", 1U	TS253	\$69.95

(For more information on Fiber Taps, see [blackbox.com](#).)

For Copper Taps, see p. 15.)

TECH SPECS

FOMM-200:

Accuracy — $\pm 5\% \pm 1 \text{ nW}$

Auto Power Off — Yes

Backlight — Yes

Calibrated Wavelength — 850, 1300, 1310, 1490, 1550, 1625 nm

Display Precision — 0.01

Display Units — dB, dBm, mW, μW

Laser Source Calibrated Wavelength — 1310, 1490, 1550 nm

Measuring Range (dBm) — -70 to +10 dBm

Reference Value — Yes

Temperature — Operating: +4 to +122° F (-10 to +50° C);

Storage: -4 to +158° F (-20 to +70° C)

Wavelength Recognition — 1310, 1490, 1550 nm (input power $\geq -40 \text{ dBm}$)

Tone Detection — 270 Hz, 1 kHz, 2 kHz (input power $\geq -40 \text{ dBm}$)

Modulated Frequencies — 270 Hz, 1 kHz, 2 kHz

Output Power — -5 dBm $\pm 0.5 \text{ dB}$

Output Stability* —

Short term (15 minutes): 1310/1550 nm: $\pm 0.05 \text{ dB}$;

1490 nm: $\pm 0.1 \text{ dB}$;

Long term (8 hours): 1310/1550 nm: $\pm 0.1 \text{ dB}$;

1490 nm: $\pm 0.1 \text{ dB}$

Connector — Interchangeable FC/SC/ST for PC/APC

Power Supply — (2) 1.2-V Ni-MH batteries, AC adapter

Size — 6.6"H x 3"W x 1.7"L (16.8 x 7.6 x 4.3 cm)

Weight — 0.6 lb. (0.3 kg)

*Valid at 1550 nm, CW, 23° C $\pm 3^\circ$ C; Relative humidity equal to 70%, with an FC connector.

Fiber

Visual Light Source Pen for Fiber • Visual Fault Locator for Fiber

Identify faults and leaks in fiber cable.

- Isolate light leaks in single- and multimode fiber optic cable.
- Identify fiber breaks, tight bends, bad connectors, and poor splices.
- Use to test patch cables, distribution panels, splice trays, and more.
- Work with jacketed and bare fiber.
- Find faults in the dead zone of an OTDR.
- Verify continuity.
- Auto-off function prolongs battery life.

Visual Light Source Pen for Fiber

- Features a 650-nm wavelength and a 2-Hz modulated frequency.
- Includes a universal SC/ST®/FC connector.
- Provides 1 mW/0 dBm of output power.

Visual Fault Locator for Fiber

- Tests longer distances with three output levels: 0 dBm, +3 dBm, and a powerful +8 dBm.
- Features a 650-nm wavelength and a switch-selectable CW/2-Hz modulated frequency.
- Includes an FC/PC connector. SC/PC and ST/PC interchangeable connectors are available.

♦♦ **WARRANTY** — Both: 2 Years



FOVFL-PEN

FOVFL

TECH SPECS

Frequency (Modulated) — 2 Hz
Output Power — FOVFL-PEN: 1 mW/0 dBm;
FOVFL: 0 dBm, +3 dBm, +8 dBm (adjustable)
Wavelength — 650 nm $\pm$ 10 nm
Connectors — FOVFL-PEN: (1) universal FC/SC/ST
FOVFL: FC/PC, SC/PC, ST/PC interchangeable
connectors included
Power — FOVFL-PEN: (2) AA alkaline batteries;
AC adapter;
FOVFL: (1) 3.6-V lithium ion battery (included),
AC adapter (included)
Size — FOVFL-PEN: 4.5"H x 2.5"W x 1.2"D
(11.4 x 6.4 x 3 cm);
FOVFL: 4.5"H x 2.5"W x 1.2"D (11.5 x 6.5 x 3 cm)
Weight — 0.3 lb. (0.1 kg)

Item	Code	List Price
Visual Light Source Pen for Fiber	FOVFL-PEN	\$349.99
Visual Fault Locator for Fiber	FOVFL	\$367.95

Live Traffic Identifier

Safely repair a problem fiber without disrupting live fibers.

- Eliminates the need to open the fiber at the splice point so you don't interrupt service.
- The non-destructive macro-bend detection technology doesn't damage the fiber.
- Detects low frequency tones at 270 Hz, 1 kHz, and 2 kHz.
- A range of 850 to 1700 nm enables use on single-mode and multimode fiber.
- A tone sounds when traffic is present.
- Traffic direction is also indicated by LEDs.
- Use with 900- μ m buffered fiber, 250- μ m coated or ribbon fiber, and 3-mm jacketed fiber. Three adapters are included.
- Displays the relative core power to help identify bad connectors and splice points.
- Can be used with a light source.
- ♦♦ **WARRANTY** — 2 Years



Item	Code	List Price
Live Traffic Identifier	FOLTI	\$1795.00

♦ Includes (1) fiber optic probe; (3) adapter heads for jacketed, coated, and ribbon fiber; (1) carrying case.

Fusion Splicer with Core Alignment

Get free calibration for three years with this economically smart splicer.

- Free annual calibration and cleaning for three years.
- Get performance associated with much higher priced splicers.
- Automatically aligns the core.
- Has a reversible color LCD monitor with a control panel on each side.
- Features 256X magnification.
- Maximum wind velocity is 15 mph.
- Offers 8-second splice times and 40-second tube-heat times.
- Has simultaneous X and Y axis views.
- The large-capacity internal battery works for 200 splices.
- A system test ensures optimal performance.
- Automatically checks the fiber end face.
- Automatically calibrates parameters.
- Stores 8000 splice results.
- For more details, call our FREE Tech Support.
- ♦♦ **WARRANTY** — 2 Years



The Fusion Splicer with Core Alignment offers you functionality and features associated with much more expensive splicers. Plus, you get free calibration and cleaning once a year for three years. The dual-axis view and reversible color monitor with control panels on each side ensures you'll make quality, efficient splices. The splicer is designed to work with all types of fiber cable.

TECH SPECS

Auto Calibrate — Yes
Auto Check Fiber End Face — Yes
Camera Axis — X and Y axis
Cladding — 100–150- μ m
Cleaved Length — 16 mm (standard)
Coating — 10–1000- μ m
Data Storage — 8000 splices
Fiber Type — Multimode and single-mode, dispersion shifted (DS), non-zero dispersion shifted (NZ-DS), and erbium doped fiber (EDF)
Languages — English, Spanish, Russian, Chinese, Korean
Protection Sleeve Length — 20 mm, 40 mm, 60 mm
Splice Loss (Average) — Multimode: 0.01 dB;
 Single-mode: 0.02 dB;
 DS and NZDS: 0.04 dB
Splicing Mode — Auto, manual
Temperature — Operating: -13 to +122° F (-25 to +50° C);
 Storage: -40 to +176° F (-40 to +80° C)
Tension Test — 2.0 N (standard)
Time — Heater: 40 seconds (best);
 Splice: 8 seconds
User Programmable — Yes
Wind Velocity (Maximum) — 15 mph
Interface — RS-232, video output (VGA)
Power — Internal 12-V battery (200 splices); DC adapter
Size — 5.5"H x 6.5"W x 6.5"D (13.9 x 16.5 x 16.5 cm)
Weight — 7.3 lb. (3.3 kg)

Pro-Tips

Have lots of splicing to do?
Go fusion.

Although the initial investment in a fusion splicer may start at \$10,000, the cost per splice is very inexpensive, and may only be a dollar or two. Fusion splicers are ideal for outside plant splicing on single-mode cable.

If you need to make just a few splices, use a mechanical splicing method. The cost per splice is higher, but you don't have a large initial investment in equipment.

Item	Code	List Price
Fusion Splicer	FOFSCA	\$9999.00
♦ Includes (1) splicer and FREE annual calibration for 3 years.		

Fiber

Fluke Networks SimpliFiber Pro Optical Power Meter and Fiber Test Kit
Completes testing in half the time!

- Includes the SimpliFiber Pro optical power meter, 850/1300 multimode source, carrying case, and an SC power-meter adapter.
- Features single-port, simultaneous dual-wavelength testing, which provides results in half the time.
- The CheckActive™ feature emits an audible tone and displays an icon when the tester detects a live fiber.
- The FindFiber™ Remote ID enables you to quickly identify cable connections without the need for another person at the other end of the link.
- Large internal memory enables you to save up to 1000 results for continuous testing and recording.
- LinkWare™ Cable Test Management software helps to analyze test results and create professional test reports.



TECH SPECS

Detector Type — InGaAs
Display — Optical Power Meter: Resolution (dB or dBm): 0.01 dB;
Display Units: dBm, mW, µW
Emitter — LED
Measurement Range — Optical Power Meter: 850 nm: +10 to -52 dBm;
1300, 1310, 1490, 1550, 1625 nm: +10 to -60 dBm
Wavelengths — 850, 1300 nm
Connectors — Optical Power Meter: (1) USB 2.0; (1) removable SC adapter (ST and LC are also available); Multimode Optical Source: (1) SC

- ♦♦ **WARRANTY** — 1 Year

Item	Code	List Price
Fluke Networks® SimpliFiber® Pro Optical Power Meter and Fiber Test Kit	FTK1000	\$1995.00

Fluke Networks FiberInspector Video Microscope
Avoid the main cause of fiber link failure—dirty end-faces.

- Enables you to inspect fiber connectors on patch panels and network devices quickly and safely.
- Detects dirt, dust, and other contaminants that interfere with data transmission.
- Inspects the fiber in place—no need to reach behind patch panels or disassemble hardware.
- Never touches the termination, reducing contamination risk.
- Contains high-magnification optics that provide crisp, clear images of microscopic debris and end-face damage.
- ♦♦ **WARRANTY** — 1 Year

TECH SPECS

Battery Life — 2 hours continuous use
Camera Type — 0.3 in. (8.4 mm) CCD with adjustable focus
Display Type — 3.5 in. (9 cm) TFT, active matrix, 320 x 240 pixels
Magnification (Probe) — 250x, 400x
Power Source — Lithium ion or AC power
Video Output — NTSC
Size — Display: 9.1" H x 4.3" W x 2.6" D (5.3 x 10 x 22 cm);
Probe: 5.5" H x 1.8" W x 1.7" D (14 x 4.6 x 4.3 cm)
Weight — Display: 0.8 lb. (0.4 kg);
Probe: 0.4 lb. (0.2 kg)



Item	Code	List Price
Fluke Networks FiberInspector™ Video Microscope	FT600	\$3495.00

Black Box is your source for Fluke Networks Testers and Scanners.



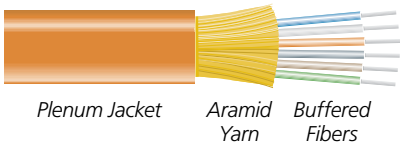
- Fluke testers and scanners for fiber and copper give you reliable network performance analysis, application management, and monitoring.
- Intuitive interfaces and portable, efficient designs make network testing and analysis a snap.
- Black Box has a wide selection of Fluke Networks™ testers and scanners. For details, go to **blackbox.com**.
- Call us for the best price.
- Don't see what you're looking for? Call our FREE Tech Support today at 724-746-5500, and we'll get you what you need.

The best of both worlds: Fluke Networks testers and fast,
FREE Black Box Tech Support.

Cable

Multimode, Distribution-Style, Custom-Length Fiber Optic Bulk Cable

Run 50- or 62.5-micron tight-buffered cable in the exact lengths you want.



- Ideal for runs between wiring closets and equipment rooms.
- Custom cut to the length you need.
- Terminate into loaded patch panels and equipment.
- Use for backbone intrabuilding runs.
- Construction consists of an outer jacket, aramid yarn, and tight-buffered fibers.
- Features a 900-µm coating for easy stripping and handling.
- Cable is RoHS compliant.

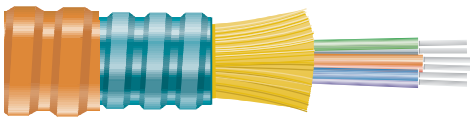
◆◆ **WARRANTY** — Lifetime



Item	Code	List Price
Multimode, Distribution-Style, Custom-Length Fiber Optic Bulk Cable, Plenum		
50-Micron		
6-Fiber	EXP35006A	\$.98/ft.
12-Fiber	EXP35012A	\$1.65/ft.
62.5-Micron		
6-Fiber	EXP3006A	\$.98/ft.
12-Fiber	EXP3012A	\$1.65/ft.

Interlocking Armored Fiber

Save nearly 30%! Run this armored cable anywhere in your building—no ducts required!

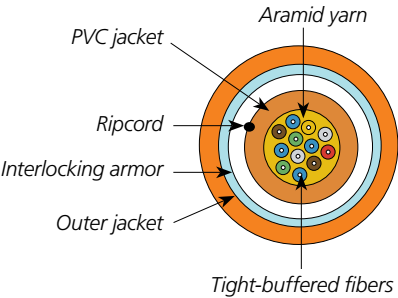


This fiber cable is jacketed in aluminum interlocking armor so you can run it anywhere in your building! There's no need to pull innerduct!

- Save nearly 30% on labor and materials. Pull this cable once instead of pulling conduit and then pulling cable!
- Cut labor costs by more than half!
- Built tough to go anywhere in your building.
- UL® Listed with aluminum interlocking armor covering an internal PVC jacket.
- Lightweight and flexible but also extraordinarily strong.
- Ideal for harsh environments, this cable is rugged and rodent resistant.
- Save plenum space, too! Cable is almost an inch smaller than innerducts!
- Ideal for out-of-the-way Gigabit Ethernet premise links.
- Features 12 tight-buffered 62.5-/125-µm strands.
- ◆◆ **WARRANTY** — Lifetime

NOTE: Costs based on a 500-foot run using Black Box materials. Labor costs are estimated and can vary widely based on the building and environment.

➔ **Click and find at blackbox.com:**
Interlocking Armored specifications



Check out how you can save nearly 30% on labor and materials!

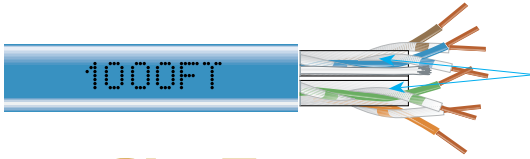
The Expensive Way:	
12-fiber plenum cable (500 ft.)	\$800
Plenum innerduct	\$1415
Labor to pull cable and innerduct	\$1300
Total	\$3515

The Interlocking Armored Way:	
Interlocking Armored Cable (500-ft.)	\$2060
Labor to pull cable.....	\$450
Total	\$2510
Save 28.5%	

Item	Code	List Price
Interlocking Armored, 12-Strand, 62.5-Micron Multimode Fiber Optic Cable, Plenum (OFCP) Custom Lengths		
	EXP1A3012A	\$4.12/ft.

GigaTrue 550 CAT6, 550-MHz Solid Bulk Cable (UTP)

Great prices for high-performance cable!



Cross-web design increases strength and performance.

GigaTrue®**CAT6**

- Exceeds CAT6 with plenty of headroom.
- Guaranteed to exceed ANSI/TIA/EIA-568-B.2-1 CAT6 and ISO/IEC 11801 Class E requirements.
- Ideal for digital video, 100-Mbps TP-PMD, and 155-Mbps ATM and Gigabit Ethernet.
- Cable is marked in two-foot increments.

- **WARRANTY** — Lifetime

Click and find at **blackbox.com**:
GigaTrue 550 CAT6 specifications

Item	Blue	Yellow	White	Gray	List Price
GigaTrue® 550 CAT6, 550-MHz Solid Bulk Cable (UTP), 23 AWG, 4-Pair, 1000-ft. (304.8), Pull Box					
PVC	EYN870A-PB-1000	EYN872A-PB-1000	EYN874A-PB-1000	EYN876A-PB-1000	\$109.95
Plenum	EYN871A-PB-1000	EYN873A-PB-1000	EYN875A-PB-1000	EYN877A-PB-1000	\$309.95
	Green	Red	Black		List Price
GigaTrue 550 CAT6, 550-MHz Solid Bulk Cable (UTP), 23 AWG, 4-Pair, 1000-ft. (304.8), Pull Box					
PVC	EYN878A-PB-1000	EYN868A-PB-1000	EYN880A-PB-1000		\$109.95
Plenum	EYN879A-PB-1000	EYN869A-PB-1000	EYN881A-PB-1000		\$309.95

GigaBase 350 CAT5e, 350-MHz Solid Bulk Cable (UTP)

Save BIG with our everyday LOW prices!

**GigaBase®****CAT5e**

- Cable is marked in two-foot increments.
- Extra headroom gives room for growth.
- Ideal for voice, 100BASE-TX, 100-Mbps TP-PMD, T1, 155-Mbps ATM, 622-Mbps ATM, Gigabit Ethernet, and other high-speed applications.

- Rip cord for easy jacket opening.
- Low attenuation and power-sum crosstalk characteristics over an extended frequency range.
- **WARRANTY** — Lifetime

Click and find at **blackbox.com**:
GigaBase 350 CAT5e specifications

Item	Blue	Yellow	White	Gray	List Price
GigaBase® 350 CAT5e, 350-MHz Solid Bulk Cable (UTP), 24 AWG, 4-Pair, 1000-ft. (304.8), Pull Box					
PVC	EYN851A-PB-1000	EYN855A-PB-1000	EYN853A-PB-1000	EYN857A-PB-1000	\$79.95
Plenum	EYN850A-PB-1000	EYN854A-PB-1000	EYN852A-PB-1000	EYN856A-PB-1000	\$209.95
	Green	Red	Black		List Price
GigaBase 350 CAT5e, 350-MHz Solid Bulk Cable (UTP), 24 AWG, 4-Pair, 1000-ft. (304.8), Pull Box					
PVC	EYN859A-PB-1000	EYN849A-PB-1000	EYN861A-PB-1000		\$79.95
Plenum	EYN858A-PB-1000	EYN848A-PB-1000	EYN860A-PB-1000		\$209.95

Tool Kits

Premise Tool Kit

22 tools for testing and mapping your copper cables.

What's included

- Crimp tool frame
- (3) die sets
- Punchdown tool
- (2) punchdown blades
- LAN Pro tester (tester and remote)
- Telephone test set and cable mapper, including (1) tone generator and (1) tone probe
- Coax cable cutter and stripper
- UTP/STP/flat cable cutter and stripper
- (4) adapters
- (4) patch cords
- Carrying case, 5"H x 20.25"W x 14.75"D



- ♦♦ **WARRANTY** — Lifetime

Click and find at **blackbox.com**:
The complete list of included items

Item	Code	List Price
Premise Tool Kit	FT145A-R2	\$453.95

Professional's Tool Kit

39 tools the pros use for PC repair.

What's included

- Hex Allen set
- Soldering iron and desoldering tool
- (2) spudgers
- Disposable flashlight
- AC polarity tester
- Trimpot adjuster
- Self-locking tweezers
- (2) screwstarters
- (4) screwdrivers
- (6) screwdriver blades
- (3) nutdriver blades
- (2) driver handles
- Extension blade, 4"
- Precision knife
- Electrician's scissors
- Wire stripper
- (5) pliers
- Wrench
- Magnetic parts extractor
- Carrying case, 3"H x 16"W x 11"D



- ♦♦ **WARRANTY** — Lifetime

Click and find at **blackbox.com**:
The complete list of included items

Item	Code	List Price
Professional's Tool Kit	FT805-R2	\$399.95

Voice/Data Tool Kit

43 tools for working on phone lines and LANs.

What's included

- (8) screwdrivers
- (4) Torx® drivers
- (2) balldriver key sets
- (4) pliers
- Electrician's scissors
- Precision knife
- Adjustable wrench
- Metric tape measure
- Soldering iron and desolder braid
- T6 stripper
- Circuit tester
- Telephone line tester
- Pocket flashlight
- (2) cutters
- (4) nutdrivers
- (3) adapters
- Impact tool and blade
- (2) gender changers
- 8" case



- ♦♦ **WARRANTY** — Lifetime

Click and find at **blackbox.com**:
The complete list of included items

Item	Code	List Price
Voice/Data Tool Kit	FT103A-R2	\$841.95

Black Box is your source for all the tools pros like you need to maintain today's networks.



- Find hundreds of tools, including fiber and crimp tools, tool kits, activity monitors, termination kits, installation accessories—everything you need from the data center to the telecomm room.
- Quantity discounts available. Just ask.
- For free expert advice, call us at 724-746-5500.
- To see our complete selection, visit blackbox.com.

Let Black Box Tech Support help you pass the test.

724-746-5500

Get the right help, right now.

- » FREE, live, 24/7.
- » Calls answered in 20 seconds or less.
- » Based in Lawrence, Pennsylvania.



Version 1.0

#229

PRSRT STD
U.S. POSTAGE
PAID
Black Box
Corporation

Cut out card and take Black Box
wherever you go.



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